

REMARKS

This amendment is intended as a full and complete response to the non-final Office Action dated February 25, 2008. In the Office Action, claims 1-4 and 6-20 are pending, of which claims 1-4 and 6-16 are rejected and claims 17-20 are withdrawn. By this amendment claims 1 and 15 have been amended, and claims 2-4 and 6-14 and 16 continue unamended.

In view of the amendments presented above and the following discussion, it is submitted that none of the claims now pending in the application are anticipated or obvious under the provisions of 35 U.S.C. §102 and §103. Thus, it is believed that all of these claims are now in allowable form.

REJECTION OF THE CLAIMS

A. Rejection of claims 1, 3, 4, 8-11 and 13-16 under 35 U.S.C. §102

Claims 1, 3, 4, 8-11 and 13-16 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. patent no. 5,409,477 to Caron et al. (hereinafter "Caron"). The rejection is respectfully traversed.

Independent Claim 1 (and similarly independent claim 15), as amended, recites:

A flow restriction device configured to be fitted in a fluid line, the restriction device comprising a conduit part provided with a baffle which includes an opening that links an upstream and downstream section of said line, wherein said opening in said baffle has a diameter dimension of between 1 μ m and 50 μ m, the thickness of said baffle being in the range of 0.05 mm and 0.5 mm, said conduit part and said baffle being produced from one piece of plastic material, and the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar. (Emphasis added).

As a preliminary matter, we believe that it would be helpful to review the appropriate standard under 35 U.S.C. § 102 for analyzing the features of a claim with respect to the prior art. It is well settled that "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention,

arranged as in the claim” (Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). The Caron patent fails to disclose each and every element of the claimed invention, as arranged in the claim.

The Caron patent discloses:

Referring now to FIGS. 2 and 3, an orifice flow restrictor 12 of the present invention is shown more fully in detail. The flow restrictor 12 includes an elongated body 24, with an inlet port 26, and an outlet port 28 formed therein. Separating the inlet and outlet ports 26, 28 is a barrier-like wall or orifice plate 30. ... An orifice 48 is drilled through plate 30, which defines a flow control passage, and which extends from about the center of depression 44 to outlet port 28. The orifice 48 has a predetermined cross-sectional flow area which provides accurate predetermined flow communication between inlet port 26 and outlet port 28. (see Caron, col. 3, lines 5-24).

Furthermore, Caron discloses:

The orifice 48 was drilled using a Resonetics, Eximer laser. The ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1. Conversely, orifice 48 must be at least one tenth of the length, L, of the flow control passage through plate 30 at a point adjacent to the orifice 48. In the flow restrictor 12 as illustrated, the ratio of thickness, t, to the diameter of orifice 48 is about 5.2:1. (See Caron, column 3, lines 33-45 (emphasis added).

Nowhere in the Caron patent is there any teaching or suggestion of " the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar." In particular, "[w]ith the relatively small diameter of the opening, the length thereof is substantial. In this context the length is preferably in any event at least so chosen that laminar flow prevails in the openings. More particularly, a length/diameter ratio of greater than 10 is chosen in order to make such a flow laminar." (See paragraph 0028 of the specification in corresponding US Publication 20070157986 of the present application, emphasis added).

Rather, Caron specifically discloses that the ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1. The Caron patent is different from and teaches away from the Applicant's invention, since the ratio of the baffle thickness to the diameter of the orifice is greater than 10, thereby allowing the flow through the openings to be laminar.

Accordingly, the Caron patent fails to disclose, or even suggest the claimed feature of "the ratio of the thickness of said baffle and the diameter of said opening being greater than 10, such that the liquid flow through said flow restriction is laminar." In fact, the flow restriction of the present invention overcomes the maximum thickness to diameter ratio restrictions disclosed in the prior art, such that the thickness/diameter ratio is now greater than 10. Therefore, the Caron patent fails to teach each and every element of the claimed invention, as arranged in the claim.

As such, the Applicant submits that independent Claims 1 and 15 are not anticipated and fully satisfy the requirements under 35 U.S.C. §102 and are patentable thereunder. Furthermore, Claims 2-4, 6-14 and 16 depend, either directly or indirectly, from independent Claims 1 and 15, and recite additional features of the invention. As such, the Applicant submits that these dependent claims fully satisfy the requirements under 35 U.S.C. §102 and are patentable thereunder. Therefore, the Applicant respectfully requests that the claim rejections be withdrawn.

B. Rejection of claim 12 under 35 U.S.C. §103

Claim 12 stands rejected under 35 U.S.C. §103 as being obvious over U.S. patent no. 5,409,477 to Caron et al. (hereinafter "Caron") in view of U.S. patent no. 4,654,026 to Underwood. The rejection is respectfully traversed.

Claim 12 depends from independent claim 1 and recites additional features considered inventive. In particular, claim 12, when written in independent form, recites:

A flow restriction device configured to be fitted in a fluid line, the restriction device comprising a conduit part provided with a baffle which includes an opening that links an upstream and downstream section of said line, wherein said opening in said baffle has a diameter dimension of between 1µm and 50µm,

the thickness of said baffle being in the range of 0.05 mm and 0.5 mm, said conduit part and said baffle being produced from one piece of plastic material, and the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar, said flow restriction having identification means. (Emphasis added).

As a preliminary matter, we believe that it would be helpful to review the appropriate standard under 35 U.S.C. § 103 for analyzing the features of a claim with respect to the prior art. It is well settled that [t]he test under 35 U.S.C. § 103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy, 110 USPQ 1021, 1024 (Fed. Cir. 1984) (emphasis added). Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. In re Wright, 6 USPQ 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added).

As discussed above, the Caron patent discloses that the ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1. Conversely, the present claims recite that the ratio of the thickness of the baffle to the diameter of the opening that is greater than 10. Accordingly, the Caron patent teaches away from the present invention.

Furthermore, the Underwood patent merely discloses that printed numbers are disposed at intervals along tubes 7 and 9. (See Underwood, col. 4, lines 8-13). The Underwood patent is completely silent with respect to disclosing or suggesting that "the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar."

Even if the two cited patents could somehow be operably combined, the combination would merely disclose the ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1, and printed numbers are disposed at intervals along tubes. Nowhere does the combination of the Caron and Underwood patents disclose or suggest the claimed feature of "the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar."

Further, the combination of the cited patents teaches away from the present invention. The Caron and Underwood patents are directed to a single situation for providing liquid fluids. By contrast, the present invention can be used for a wide range of volumes which can be displaced through the opening in the flow restriction. Specifically, the flow restriction of the present invention can be used for both liquids and gasses.

Further, the relationship between changes in flow is linear with change in pressure. Although a laminar flow through a flow restriction is generally known in the art, the Caron patent specifically discloses that "to maintain the fluid flow characteristics of an orifice, the maximum ratio of plate thickness to orifice diameter is 10:1." (See Caron patent, col. 2, lines 8-10). By contrast, the flow restriction of the present invention overcomes the maximum thickness to diameter ratio restrictions of the prior art, such that the thickness/diameter ratio is greater than 10. Therefore, the combination of the Caron and Underwood patents fail to disclose, suggest or predict the invention as a whole.

As such, the Applicant submits that dependent Claim 12 is not obvious and fully satisfies the requirements under 35 U.S.C. §103 and is patentable thereunder. Therefore, the Applicant respectfully requests that the claim rejection be withdrawn.

C. Rejection of claims 2, 6 and 7 under 35 U.S.C. §103

Claims 2, 6 and 7 stands rejected under 35 U.S.C. §103 as being obvious over U.S. patent no. 5,409,477 to Caron et al. (hereinafter "Caron") in view of U.S. patent no. 2,484,418 to Mercier. The rejection is respectfully traversed.

Claims 2, 6 and 7 depend from independent claim 1 and recite additional features considered inventive. In particular, claims 2, 6 and 7, recite in part:

A flow restriction device configured to be fitted in a fluid line, the restriction device comprising a conduit part provided with a baffle which includes an opening that links an upstream and downstream section of said line, wherein said opening in said baffle has a diameter dimension of between 1µm and 50µm, the thickness of said baffle being in the range of 0.05 mm and 0.5 mm, said conduit part and said baffle being produced from one piece of plastic material, and the ratio of the thickness of said baffle to the diameter of said opening being greater than 10. such that liquid flowing through said flow restriction is laminar, ... (Emphasis added).

As discussed above, the Caron patent discloses that the ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1. Conversely, the present invention has a ration of the thickness of the baffle to the diameter of the opening that is greater than 10. Accordingly, the Caron patent teaches away from the present invention.

Furthermore, the Mercier patent merely discloses "a disc-shaped member 6, pierced by a plurality of small channels 7 of special shape". (See Mercier, col. 3, lines 26-29). The Mercier patent is completely silent with respect to disclosing or suggesting that "the ratio of the thickness of said baffle and the diameter of said opening being greater than 10, such that the liquid flow through said flow restriction is laminar."

Even if the two cited patents could somehow be operably combined, the combination would merely disclose the ratio of the thickness of plate 30, between the base of depression 44 and the distal surface 50 of plate 30, to the diameter of orifice 48, is limited to a maximum of 10:1, and a plurality of opening of special shape. As discussed above, the Caron patent teaches away from the flow restriction of the present invention. That is, nowhere does the combination of the Caron and Mercier patents disclose or suggest the claimed feature of "the ratio of the thickness of said baffle to the diameter of said opening being greater than 10, such that liquid flowing through said flow restriction is laminar." In fact, the flow restriction of the present invention overcomes the maximum thickness to diameter ratio restrictions of the prior art, such that the thickness/diameter ratio is now greater than 10. Therefore, the Caron and Mercier patents fail to disclose, suggest or predict the invention as a whole.

As such, the Applicant submits that dependent Claims 2, 6 and 7 are not obvious and fully satisfy the requirements under 35 U.S.C. §103 and are patentable thereunder. Therefore, the Applicant respectfully requests that the claim rejections be withdrawn.

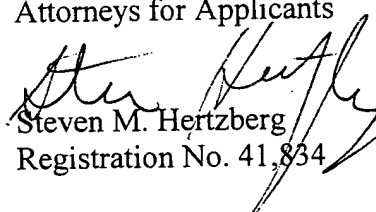
Conclusion

It is submitted that none of the claims now pending in the application are anticipated or obvious under the provisions of 35 U.S.C. §102 and §103. Thus, it is believed that all of these claims are now in allowable form. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse action to any of the pending claims in the application, it is respectfully requested that the examiner telephone Steven M. Hertzberg at (212) 885-9223 so that the appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Any fees associated with this Amendment may be charged to Deposit Account No. 01-0035.

Respectfully submitted,
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